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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 10/671,444 | 09/29/2003 | Kenji Araki | 117361 | 6688 |
| 25944 | 7590 | 04/04/2007 | EXAMINER | |
| OLIFF & BERRIDGE, PLC P.O. BOX 19928 ALEXANDRIA, VA 22320 | | | TRINH, THANH TRUC | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 1753 | |
| SHORTENED STATUTORY PERIOD OF RESPONSE | | MAIL DATE | DELIVERY MODE | |
| 3 MONTHS | | 04/04/2007 | PAPER | |

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

| | | | |
|------------------------------|------------------------------|------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/671,444 | ARAKI ET AL. | |
| | Examiner Thanh-Truc Trinh | Art Unit 1753 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 29 September 2003.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 1 and 2 is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 3-20 is/are rejected.
- 7) Claim(s) 16 is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>9/29/2003</u> . | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| | 6) <input type="checkbox"/> Other: _____. |

DETAILED ACTION***Election/Restrictions***

Applicant's election with traverse of Group II including claims 3-20 in the reply filed on 02/13/2007 is acknowledged. The traversal is on the ground(s) that "the search and examination of the entire application could be made without serious burden". This is not found persuasive because Group I containing a metallic sheet with a lower coefficient of thermal expansion than the second lead electrode. This feature is distinct and required a different search.

Since Applicant has elected Group II, claims 1-2 are withdrawn from consideration. Claims 3-20 are examined. (See below)

The requirement is still deemed proper and is therefore made FINAL.

Claim Objections

1. Claim 16 is objected to because of the following informalities:

Page 58 line 5, "sad metallic foils" should be -- said metallic foils--.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 3-6, 9-13 are rejected under 35 U.S.C. 102(b) as being anticipated by O'Neil et al. (US Patent 5498297).

See Figures 1-2, 4.

Regarding claim 3, O' Neil et al. disclose a photovoltaic electric generator of concentrator type comprising an array of a plurality of solar cell assemblies (6) each including a solar cell (13), and electrically conductive members (copper ribbons 15, 16) in the form of metallic foils (See col. 4 line 5); a heat dissipating layer (42, 39, 41) formed of a synthetic resin containing a thermally conductive filler (See col. 4 lines 32-40 and col. 6 lines 1-4); and a base plate (heat sink 10) to which each of solar cell assemblies is fixed through the heat dissipating layer and wherein the solar of each solar cell assembly is embedded in the heat dissipating layer. (See Figures 1-2, 4)

Regarding claim 4, O' Neil et al. describe the heat dissipating layer is formed of a material of a thermoplastic material, Tefzel pressure sensitive adhesive. (See col. 6 lines 1-4).

Regarding claim 5, O' Neil et al. describe the solar cell has a light-receiving surface, and said electrically conductive members (copper ribbons 15, 16) in the form of metallic foils extend outwardly from a periphery of the solar cell in a plane parallel to the light receiving surface. (See Figures 2, 4).

Regarding claim 6, O' Neil et al. describe the solar cell has a light-receiving surface, and each of the plurality of solar cell assemblies further includes a sealing layer (37) which is formed of a transparent resin and which covers the light receiving surface. (See Figure 4 and col. 4 lines 36-37)

Regarding claims 9-10, O' Neil et al. disclose a photovoltaic electric generator of concentrator type comprising an array of a plurality of solar cell assemblies (6) each including a solar cell, and electrically conductive members (copper ribbons 15, 16) in the form of metallic foils; a heat dissipating layer (41, 39, 43) formed of a synthetic resin containing a thermally conductive filler (See col. 4 lines 32-40 and col. 6 lines 1-4); and a base plate (10) to which each of solar cell assemblies is fixed through heat dissipating layer, and wherein the heat dissipating layer consists of a first layer and a second layer located on one of opposite sides of the first layer which is remote from the base plate (See col. 4 lines 32-40 and col. 6 lines 1-4. The second layer is formed of a material of a thermoplastic material, Tefzel pressure sensitive adhesive. The first layer is also formed of Tefzel pressure sensitive adhesive which is a thermosetting material. (See Figures 1-2, 4)

3. Claims 3-15 are rejected under 35 U.S.C. 102(b) as being anticipated by Tourneux (US Patent 4210462).

See Figures 1-4.

Regarding claim 3, Tourneux discloses a photovoltaic electric generator of concentrator type comprising an array of a plurality of solar cell assemblies each including a solar cell 11, and electrically conductive members (12, 13) in the form of metallic foils (col. 6 lines 16-19); a heat dissipating layer (comprising inset plate 16 and adhesive 19) formed of a synthetic resin containing a thermally conductive filler (See col. 2 lines 34-39); and a base plate (plates 14 or 15) to which each of solar cell assemblies is fixed through the heat dissipating layer and wherein the solar of each solar cell assembly is embedded in the heat dissipating layer.

Regarding claim 4, Tourneux describes the heat dissipating layer is formed of a material selected from a group consisting of a thermoplastic material; and a non-thermoplastic material with a modulus of elasticity or coefficient of viscosity of which is lowered to a minimal value during a rise of a temperature of the non-thermoplastic material within a predetermined range in the process of heating the material to cure the non-thermoplastic material. (See col. 2 lines 58-68)

Regarding claim 5, Tourneux discloses a photovoltaic electric generator of concentrator type, wherein the solar cell has a light-receiving surface, and said electrically conductive members (12 and 13) in the form of metallic foils (col. 6 lines 16-19) extend outwardly from a periphery of the solar cell in a plane parallel to the light receiving surface.

Regarding claim 6, Tourneux discloses a photovoltaic electric generator of concentrator type, wherein the solar cell has a light-receiving surface, and each of the plurality of solar cell assemblies further includes a sealing layer (top layer 19 in Figure 1, top layer 29 in Figure 2 and top layer 39b in Figure 3) which is formed of a transparent resin (col. 4 lines 11-12 and col. 2 lines 66-68) and which covers the light receiving surface. (See Figures 1-3).

Regarding claim 7, Tourneux discloses a photovoltaic generator of concentrator type, where in the sealing layer has a light receiving surface, and each of the plurality of solar cell assemblies further includes a transparent glass plate (glass plate 14 or 15 in Figure 1, 24 or 25 in Figure 2, 34 or 35 in Figure 3, and See col. 3 lines 54-55) in which cover the light receiving surface of the sealing layer. (See Figures 1-3)

Regarding claim 8, Tourneux discloses a photovoltaic electric generator of concentrator type, wherein the solar cell has a light receiving surface and at least one electrode formed on the light receiving surface, and the electrically

conductive members in the form of metallic foils include at least one foil which is soldered to the electrode such that the foil is inclined at a predetermined angle with respect to an upper surface of the electrode. (See Figures 1-3 and col. 6 lines 16-19).

Regarding claim 9, Tourneux discloses a photovoltaic electric generator of concentrator type comprising an array of a plurality of solar cell assemblies each including a solar cell (11), and electrically conductive members (12, 13) in the form of metallic foils (col. 6 lines 16-19); a heat dissipating layer (inset plate 38 and adhesive 39c) formed of a synthetic resin (See col. 2 lines 58-65) containing a thermally conductive filler (adhesive 39c, and see col. 4 lines 7-10); and a base plate (15) to which each of solar cell assemblies is fixed through heat dissipating layer, and wherein the heat dissipating layer consists of a first layer (inset plates 38) and a second layer (adhesive 39c) located on one of opposite sides of the first layer which is remote from the base plate. The second layer is formed of a material selected from a group consisting of a thermoplastic material (See Figure 3 and See col. 2 lines 58-68 and col. 3 lines 1-4).

Regarding claim 10, Tourneux describes the first layer (the inset plate) and the second layer (adhesive layer) are formed of epoxy resin. (See col. 2 lines 58-68 and col. 3 lines 1-4). The epoxy resin is thermosetting. (See additional reference in supporting this property of epoxy resin, Fujisaki et al. US Patent

5942048, col. 10 lines 22-23). Therefore, Tourneux does teach the limitation of the instant claim, therefore the reference is deemed to be anticipatory.

Regarding claim 11, Tourneux describes the first layer (inset plate) of the heat dissipating layer is formed of epoxy resin. A plate is inherently made of solid material. Therefore the first layer of the heat dissipating layer is formed of solid epoxy resin. Tourneux also describes the second layer (adhesive layer) is formed of epoxy resin. (See col. 2 lines 58-68 and col. 3 lines 1-4), and in liquid form. (See col. 6 lines 26-27).

Regarding claim 12, Tourneux discloses a photovoltaic electric generator of concentrator type as described in claim 9, wherein the solar cell has a light-receiving surface, and the electrical conductive members in the form of metallic foils extend outwardly from a periphery of the solar cell in a plane parallel to the light receiving surface. (See Figure 3)

Regarding claim 13, Tourneux discloses a photovoltaic electric generator of concentrator type as described in claim 9, wherein the solar cell has a light-receiving surface, and each of the plurality of solar cell assemblies further includes a sealing layer (adhesive layer 39b) which is formed of a transparent resin (See col. 4 lines 11-12 and col. 2 lines 66-68) and which covers the light receiving surface. (See Figure 3).

Regarding claim 14, Tourneux discloses a photovoltaic electric generator of concentrator type as described in claim 9, wherein the sealing layer has a light-receiving surface, and each of the plurality of solar assemblies further includes a transparent glass plate (glass plate 14; See Figure 3 and col. 3 lines 54-55) which cover the light receiving surface of the sealing layer.

Regarding claim 15, Tourneux discloses a photovoltaic electric generator of concentrator type as described in claim 9, wherein the solar cell has a light receiving surface and at least one electrode formed on the light-receiving surface, and the electrically conductive members in the form of metallic foils include at least one foil which is soldered to the electrode such that the foil is inclined at a predetermined angle with respect to an upper surface of the electrode. (See Figure 3 and col. 6 lines 17-18).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
4. Claims 16-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tourneux in view of Haynos (US Patent 345391).

Regarding claim 16, Tourneux discloses a photovoltaic electric generator of concentrator type comprising an array of a plurality of solar cell assemblies each including a solar cell 11, and electrically conductive members (12, 13) in the form of metallic foils; a heat dissipating layer (inset plate 38 and adhesive layer 39c) formed of a synthetic resin containing a thermally conductive filler; a base plate (glass plate 15) to which each of the solar cell assemblies is fixed through the heat dissipating layer; and wherein the metallic foils are at least partially embedded in the heat dissipating layer.

Tourneux does not teach using metallic foils having a plurality of voids.

Haynos teaches using metallic foils having a plurality of voids. (See Figures 1-2 and col. 2 lines 66-72 and col. 3 lines 1-6).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the module of Tourneux by using metallic foils having a plurality of voids as taught by Haynos, because it would permit the

photovoltaic electric generator withstanding thermal and vibrational shock better, and thereby increasing its reliability. (See col. 1 lines 68-72).

Regarding claim 17, Tourneux discloses the solar cell has a light receiving surface, and the electrically conductive members in the form of metallic foils extend outwardly from a periphery of the solar cell in a plane parallel to the light receiving surface. (See Figure 3).

Regarding claim 18, Tourneux discloses the solar cell has a light-receiving surface, and each of the plurality of solar cell assemblies further includes a sealing layer (39b) which is formed of a transparent resin and which cover the light-receiving surface. (See Figure 3 and col. 4 lines 11-15)

Regarding claim 19, Tourneux discloses the sealing layer has a light receiving surface, and each of the plurality of solar cell assemblies further includes a transparent glass plate (glass plate 14, See col. 3 lines 54-55) which covers the light-receiving surface of the sealing layer. (See Figure 3)

Regarding claim 20, Tourneux discloses the solar cell has a light receiving surface and at least one electrode formed on the light receiving surface, and the electrically conductive members in the form of metallic foils include at least one foil which is soldered to the electrode such that the foil is inclined at a

predetermined angle with respect to an upper surface of the electrode. (See Figure 3 and col. 6 lines 16-19)

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanh-Truc Trinh whose telephone number is 571-272-6594. The examiner can normally be reached on 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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3/26/07


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